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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/811,419 | 03/20/2001 | Masaya Ogura | 862.C2151 | 9530 |

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 05/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,419

Applicant(s)

OGURA ET AL.

Examiner

Henry Hung V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-15 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group I (claims 1-11) in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the inventions of group I and II "are so closely related to the field of semiconductor exposure that a proper search of any of the claims would, of necessity, require a search of the others". This is not found persuasive because fact that all of the claims could be searched simultaneously does not mean that the restriction requirement is not proper. As clearly indicated in the previous Office action, the invention of group I is explicitly related to an exposure apparatus comprising means for correcting image forming characteristics of the projection optical system whereas the invention of group II is related to a method of manufacturing a semiconductor device and a plant for manufacturing a semiconductor having a local area network for interconnecting a group of devices. As such, the distinct and separate searches are quite extensive and places serious burden on the examiner in regard to both search and examination.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) because it is not clearly understood how the pressure sensor (20) can perform its functions as claimed and described in the specification such as detecting the pressure inside the chamber (14) while it is positioned inside the projection optical system (13) and the projection optical system is substantially sealed. Please explain.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 2, the recitation of “the exposing light has an...with a value of pressure inside this chamber” is indefinite. There are “at least one chamber for internally accommodating the illuminating unit, the reticle stage, the projection optics unit and the substrate stage” and “at least one chamber for sealing entirely of the exposing light has an optical path”. It is confusing what “this chamber” the applicant is referring to ?

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osakabe (U.S.Pat. 6,266,133) in view of Semba (U.S.Pat. 6,133,981).

With respect to claims 1-7, 10-11, Osakabe et al teaches a projection optical system comprising substantially all of the limitations of the instant claims as set forth above such as: an illumination optical system (2) for irradiating a reticle (4) including a light source (1); a reticle

stage for supporting the reticle; a projection optical system (6) for projecting a pattern formed on the reticle onto the substrate (5); and a substrate stage for supporting the substrate (see fig.1), at least one chamber (110) for internally accommodating the illumination optical system, the reticle stage, the substrate stage. Osakabe (fig.6) further teaches pressure sensors (33, 34) for monitoring the pressure inside and the pressure outside of the chamber (6) which encloses the projection optical system and a controller (35) for controlling and maintaining the pressure inside and pressure outside of the chamber (6) at a predetermined level. The inside of the chamber is supplied with inert gas such as nitrogen, argon, or helium to correct optical characteristics of the projection optical system based on the pressure inside the chamber. Osakabe does not expressly disclose the pressure inside the chamber higher than the pressure outside the chamber. Semba discloses an processing system comprising a first unit that accommodates an exposure apparatus for transferring a pattern formed on a mask onto a substrate; a second unit which is a coating and developing unit and a connection unit (13) placed between the first and second unit. For the purpose of preventing the contamination caused by the particles, organic solvent from the outside atmospheric may flow into the exposure apparatus, Semba teaches the pressure in the exposure apparatus (S) is set higher than the pressure in the coating and developing unit (see fig.4). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set the pressure inside the chamber higher than the ambient pressure to avoid contamination of the exposure apparatus and thus to improve the quality of the images to be printed.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osakabe (U.S.Pat. 6,266,133) in view of Semba (U.S.Pat. 6,133,981) and further in view of Aoki (JP-405210049A).

With respect to claim 8, Osakabe as modified by Semba discloses substantially all of the limitations of the instant claims except for the optical characteristics of the projection optical system being corrected based upon the index of refraction which varies in accordance with the pressure inside the chamber. Aoki teaches correcting the characteristics of the projection optical system (23) based upon the index of refraction which varies and detected by pressure sensor (19). It would have been obvious to a skilled artisan to combine the teachings of Osakabe as modified by Semba and Aoki to obtain the invention as specified in claim 8 for the purpose of correcting the characteristics of the projection optical system whereby improving the quality of the exposure apparatus.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osakabe (U.S.Pat. 6,266,133) in view of Semba (U.S.Pat. 6,133,981) and further in view of Arakawa (U.S.Pat. 6,356,338).

With regard to claim 9, Osakabe as modified by Semba lacks to show "substrate load lock chamber" and "reticle load lock chamber". Arakawa teaches an exposure apparatus having "substrate load lock chamber" and "reticle load lock chamber" (see fig.1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the "substrate load lock chamber" and "reticle load lock chamber" as taught by Arakawa into the exposure system of Osakabe as modified by Semba for at least the purpose of storing the substrates and reticles and keeping the substrates and reticles from being contaminated.

Prior Art Made of Record

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP(10154655A) discloses an exposure system for exposing a pattern onto a wafer, a gas supplier, and an airtight chamber, and the pressure inside the body of the exposure system is kept higher than the external atmospheric pressure.


Suzuki et al (U.S.Pat. 6,235,438), Koizumi et al (U.S.Pat. 4,704,348) and Miyaji et al (U.S.Pat. 5,559,584) teaches exposure apparatus, each of which comprises substantially all elements as recited in the instant claims of the present application.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Hung V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7723 for regular communications and 703-305-7723 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

hvn
May 14, 2002


RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
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